

**REMARKS**

**Status of the Claims.**

Claims 1, 3-5, 7-19, and 22-32 are pending with entry of this amendment, claims 2, 6, 20, and 21 being cancelled and no claims being added. Claims 1 and 8 are amended herein. These amendments introduce no new matter. Support for the amendment to claim 1 is found in line 1 of the claim and in the specification, *e.g.* as discussed below with reference to the "new matter" rejection. Support for the amendment to claim 8 is found in the underlined section of the Cph2 sequence shown on page 40 which comprises the first 194 amino acids of Cph2. The top of page 40 teaches that the underlining in each sequence indicates the location of the chromophore domain and the specification at page 7, line 29, to page 8, line 8, teaches that the chromophore domain and the lyase domain are interchangeable terms.

**Objections to the claims.**

Claim 8 was objected to as being of improper dependent form for allegedly failing to further limit the subject matter of a previous claim. Claim 8, as amended herein recites ". . . the polypeptide has the amino acid sequence of the first 194 amino acids of SEQ ID NO:2 (Cph2)", which further limits the ". . . between about 190 amino acids and about 400 amino acids. . ." recited in claim 1, thereby obviating this objection.

**35 U.S.C. §112, first paragraph.**

Claims 1, 3-5, 7-19, and 22-32 were rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement. In particular, the Examiner alleged that recitation of an apophytochrome polypeptide consisting of between about 190 amino acids and about 400 amino acids lacked support in the specification. Applicants traverse.

Applicants first note that the claims, as originally filed, were directed to"

. . . an apoprotein polypeptide of between about 190 amino acids and about 400 amino acids, which apoprotein polypeptide comprises a lyase domain (*see, e.g.*, claim 1 as originally filed).

At page 4, line, 25, the specification teaches that the "apoprotein is preferably an apophytochrome." At page 7, lines 15-18, the specification teaches that:

The terms "**apoprotein**", "**apophytochrome**", or "**apoprotein polypeptide**", as used herein, refer to polypeptides derived from eukaryotes, such as vascular plants, non-vascular plants, and algae, or from prokaryotes, such as cyanobacteria, or other eubacteria and archaebacteria.[emphasis added]

In addition, the sequences listed at pages 42-45 of the specification are all apophytochrome polypeptides. Moreover, the specification further teaches that the underlined regions of these sequences comprise the chromophore domain (see page 40, lines 1-3). The chromophore domain is also referred to as the lyase domain (as recited in claim 1):

The preferred apoproteins of the invention typically consist essentially of a chromophore domain. The terms "chromophore domain" or "minimal chromophore domain" or "lyase domain" refer to the apoprotein N-terminal subsequence sufficient for lyase activity and thereby form a covalent bond between the apoprotein and the bilin. Lyases are enzymes that catalyze the reversible formation of a covalent adduct between a hydroxyl- or thiol-containing substrate and a substrate containing a double bond (*i.e.* addition of a nucleophile to a double bond). Chromophore domains are typically between about 180 and about 250 amino acids, typically between about 190 amino acids and about 220 amino acids, and usually about 200 amino acids in length (*e.g.*, 197 amino acids). Typically, this spontaneous assembly results in the formation of a phytofluor. [emphasis added] (page 7, line 29, to page 8, line 8)

The specification thus teaches and provides a number of different sequences each of which is "an apophytochrome polypeptide consisting of between about 190 amino acids and about 400 amino acids, which apophytochrome polypeptide comprises a lyase domain . . . " as recited in claim 1.

The recitation of an apophytochrome polypeptide in claim 1, is thus fully supported in the specification as originally filed. The previous amendment to claim 1 does not introduce new matter. Accordingly, the rejection under 35 U.S.C. §112, first paragraph, should be withdrawn.

### 35 U.S.C. §112, second paragraph.

Claims 1, 3-5, 7-9, and 22-32 were rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite because claim 1 allegedly lacked antecedent basis for the phrase "apoprotein

polypeptide". This phrase is amended herein to recite "apophytochrome polypeptide" which finds antecedent basis in line 1 of claim 1. Accordingly, this rejection should be withdrawn.

In view of the foregoing, Applicants believes all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. Should the Examiner seek to maintain the rejections, Applicants request a telephone interview with the Examiner and the Examiner's supervisor.

If a telephone conference would expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (510) 267-4161.

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